The Research University:
Is Past Prologue to the Future?

Good afternoon. It is a pleasure to speak to the distinguished members of Sigma Xi. I am not sure how this date was chosen for this meeting, but perhaps Halloween is appropriate to the topic. Those of us in higher education now live in a time of profound change, and some would even say scary times for the institution we have come to know as the research university.

If we were to believe the harshest critics of the research university, a Halloween metaphor for their view is that it is some kind of witches brew where faculty and administrators collaborate to perpeptuate a place ~~so that~~ where neither does their job very well. The fact is that the research university is one of the greatest developments of the twentieth century. This institution is the central reason why the United States each year reaps the largest numbers of Nobel Prizes, and has the most vibrant economy in the world. It is the source of some of the greatest breakthroughs that have enhanced the quality of the lives of all mankind.

As Erich Bloch, former director of the National Science Foundation, recently testified to Congress: "The solution of virtually all the problems with which government is concerned: health, education, environment, energy, urban development, international relationships, space, economic competitiveness, and defense and national security, all depend on creating new knowledge—and hence upon the health of America's research universities."

Yet the critics persist in challenging the concept of the research university. Books like "Profscam" and "How Professors Play the Cat Guarding the Cream" have delivered to the public unflattering views of the faculty and administrators of universities, particularly research institutions. Adding to the image offered by these books are periodic "attack" pieces in the popular literature and "exposes of higher education" on television.

Pressure on the public persona of higher education and the research university comes at a time when other issues are posing challenges to our campuses:

1. A downsizing of the federal research funding agenda - it is estimated that federal funding for research will be reduced by 30% by the time the federal budget is balanced in 2002.

2. Shifting of research targets from a cold-war driven economy to an "economic war" driven economy.

3. Concern about the seeming lack of response of higher education to the dramatic economic forces that have affected almost everyone in workplace in the U.S. except those in universities.

4. Building frustration with the institution of tenure, and its mention as a reason why universities are slow to change.

5. A growing xenophobia about the presence of foreign students on our campuses and the support of these students using either state or federal funding.

6. Growth of lawsuits over socially-driven issues, to the point that considerable time and significant sums of money are being spent in defending the university.

7. Puzzlement about the seeming lack of relevance of the research university to the major concerns of the average American - crime, high K-12 drop out rates, and the breakup of the American family.

8. Questioning of what is perceived as lack of allocation of university resources and commitment to the undergraduate mission.

9. The rapid rise of new generation educational technology, information access, and communications tools that will emphasize learning over teaching.

10. The growing importance of interdisciplinary issues in the disciplinary world of the university.

While much of the criticism of the research university is uniformed, there is no question we can stand to improve and that we face substantial challenges for the future. It will require cooperation between faculty, administrators and government representatives if we are to see to the survival and fuller development of the potential of the research university. Remembering the old Laurel and Hardy movies, when the inevitable disaster was created by some combination of Ollie's and Stan's misadventures, Ollie was fond of saying to Stan, "This is a fine mess you have gotten us in." While we are not in a mess, we are in a challenging situation, and we should acknowledge that all of us need to take joint responsibility for saving the remarkable institution that is the research university.

Before beginning to define a "fix" for the research university, it behooves us to understand how we got where we are.
In the history of American higher education—a history which dates back 350 years—the concept of research universities like Georgia Tech is relatively new. In America, there have been three distinct, overlapping phases—each one giving birth to a new type of university.

The earliest American university was the colonial college. The mission of these colleges was to educate and morally uplift the coming generation. Teachers were concerned with students' moral and spiritual beliefs. Harvard, founded in 1635, was of this mold. Faculty were employed with the understanding that they would be educational mentors, and teaching, not research, was the yardstick by which faculty were measured. In 1869 during his inaugural address, Harvard president Charles Eliot, neatly summed up this philosophy when he said: "the prime business of American professors...must be regular and assiduous class teaching."

The next phase of education was the service or Land Grant universities. As the nation began to take shape, higher education's focus began to shift from the shaping of young lives to the building of a nation. During the depths of the Civil War, Congress took time from its war duties in 1862 to pass the Morrill Act, sponsored by Justin S. Morrill, a Vermont congressman. The Morrill Act contained specific ideas about a new kind of university "where the leading object shall be, without excluding other scientific and classical studies and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

During this time period, the Land Grant College Act gave federal land to each state, with proceeds from the sale supporting both education in the liberal arts and training in practical skills like agriculture and manufacturing. In a somewhat ironic twist, although Georgia Tech was established as a result of our founders' wish to provide this practical technological training to our students, the Georgia Land Grant monies went to the University of Georgia and Fort Valley State. In fact, it is useful to note that the creation of Georgia Tech was a result of a unique state legislative process and of a special philosophy not associated with other universities. I will return to this notion when we discuss the future.

The land grant university represented a shift from an emphasis on classroom education to an emphasis on applied research and service. Faculty were encouraged and rewarded to improve methods and equipment for farming and manufacturing, and bring the results to the users through outreach efforts.

Shortly after the land grant university was introduced in this country, the first research university was established with the founding of Johns Hopkins. Hopkins was modeled on the great research universities then in place in Germany, where students were awarded a new degree, the Ph.D. Faculty at these schools were encouraged to place research at the top of their priorities and were promoted and rewarded due to their performance in the laboratory, rather than the classroom. Daniel Coit Gilman the first president of Hopkins related that under other university models, "...the ablest teachers were absorbed in routine and forced to spend their strength in the discipline of tyros (beginners), so that they had no time for carrying forward their studies or for adding to human knowledge." In today's environment, this comment almost has the ring of that by the cynical wag who retorted that "students are the crabgrass on the

lawn of academia."

During the intervening years from the 1970's to World War II, many universities founded as colonial colleges moved to become research universities. Thus, Harvard became no longer only concerned with classroom teaching. Land grant universities though remained largely concerned with applied research and still with a heavy orientation towards agriculture, where funding was relatively plentiful due to the Hatch Act of 1887 and the 1914 Smith Lever Act.

World War II created the circumstances that led to a dramatic transformation and expansion of research universities. During the war years, government and universities joined together to fund and create new technology — technology which was instrumental in helping America win the war and pull itself out the Depression. After the war ended,Vannevar Bush was instrumental in preserving the partnership by establishing NSF and securing research funds for basic research in science and engineering. During this period, faculty became more specialized as discipline-based departments became more popular, and universities began to depend on the funds generated from faculty research. Also important, prestige and promotion for faculty required clear evidence for research and scholarship, grantsmanship, and graduate student production.

The sustained growth of the nation's system of research universities in the 1960's, 70's and 80's was fueled by funding from NSF and the mission agencies, particularly the military and defense establishments. At Georgia Tech these entities still fund about 55% of our total grants and contracts.

The growth of the research mission in universities was paralled by a trend for these same institutions to expand their roles in society. They found themselves providing entertainment through performing arts centers and feeding the seemingly insatiable American appetite for athletic competition through intercollegiate sports. Rapid growth has also occurred in student enrollments. Georgia Tech followed this model, with its research up from $8 million in 1960 to $200 million today, building a creative arts center and operating a Division I-A sports program that costs $19 million annually. Over the same period, Georgia Tech essentially doubled its enrollment from 6,000 to 13,000. It is easy to conclude from this that the research university is a victim of its own success and its willingness to attempt to satisfy so many of society's demands.

The modern research university is a complex domain within whose boundaries we contend with the problems of 17 and 18 year olds, anxious parents, the needs of the greatest scientists and engineers in the world, a massive facilities base, NCAA regulations, industrial and government research sponsors, sports fans angry over last weeks game, the concerns of legislators, citizens upset by student publications, societal issues, and so on.

Even if we were not facing the challenges of a new era, it is apparent that the growth bubble of the past 40 years is losing its steam since the factors driving it cannot be sustained. I suggest we are entering a time where the emphasis has to be on improving the quality of what we do rather than growing it. The past of the research university is important, but it is not the prologue to a future with dramatically different constraints and opportunities.

The issues facing research universities are remarkably similar. Yet the means to address them will vary by institution depending on factors such as whether it is state-supported or private, the nature of its financial structure, the sources of students, and its mission. Georgia Tech is in a more favorable position than many others to emerge successful in its journey towards the future. I would also remind you that Georgia Tech is a unique institution, and was so from its founding. There is no state university in the country like us and this works to our advantage - I would like to think that among those institutions that may yet fall prey to the dinosaur syndrome, Georgia Tech is one of the adaptive creatures like the human or the bird that will succeed in the next millienium. However, we will not do so if we hold onto the past.

I would propose the following guidelines as keys if we are to meet the challenges and optimize the opportunities.

1. Although we may not agree with our critics, we are obligated to listen to what they say and learn from them. We should not believe that we hold the keys to the only successful kind of learning. In Virginia in the 1770's the colony felt the local native Americans would be bettered if some of the young men were sent to Williamsburg College. They offered to take in six braves. To this the tribe replied:

"We thank you heartily. But you, who are wise, must know that different nations have different conceptions of things, and you will therefore not take it amiss, if our ideas of education happen not to be the same as yours. We have had some experience with it. Several of our young people were formerly brought up at your colleges; they were instructed in all your sciences; but, when they came back to us they were bad

runners, ignorant of every means of living in the woods, unable to bear either cold or hunger, knew neither how to build a cabin, take a deer, or kill an enemy, spoke our language imperfectly, were therefore neither fit for hunters, warriors, nor counsellors, they were totally good for nothing.

We are, however, not the less obliged by your kind offer, tho we decline accepting it; and to show our grateful sense of it, if the gentlemen of Virginia will send us a dozen of their sons, we will take care of their education; instruct them in all we know and make men of them."

We could learn from this instructive experience.

2. We need to be responsive to the issues that exist relative to the undergraduate side of our house. A recent survey at Tech showed that the majority of our sophomores and juniors are dissatisfied with our advising while 90% of the Ph.D. students are happy about the advising they get. This type of imbalance is not healthy and calls for our attention. We should also be prepared to revamp our curricula to reflect the needs of society and the industries and businesses who are the recipients of our graduates.

3. We should insure we are doing what is needed to create a learning community, on and off-campus, using all of the power of new educational technology and our legacy of Olympic residential infrastructure. While it behooves us to be cautious because of the prevalence of a sales pitch that too often is more vapor-ware than real-ware, we know that technology is going to offer much opportunity for the university willing to use its power.

4. At Georgia Tech we should remain committed to a vital research enterprise which has a purposeful role for society, and insure we do all we can to explain the value of what we do to our publics. In addition we have to encourage research in the major interdisciplinary thrusts of the future, see to improvement of those areas at Tech that are not nationally competive and find our place at the main policy tables where decisions are being made. We also have to empower our faculty by providing them access to information and to assist them in undertaking risk-based research.

5. We should be a player in the K-12 world, but do so only as it fits our mission as a research university. We are not equipped to undertake large scale efforts at revamping the K-12 system and should not plan to establish a college of education. At the same time with properly managed volunteer programs we can provide students to help, and in so doing, allow our students to learn about the larger dimensions of our world.

6. We must manage our enterprize in a cost-effective, service-directed and business-like manner while providing appropriate support to our faculty and staff. We are a major economic entity, and new demands of accountability require that we face up to our obligations to the public which provides us with much of our funding. Norm Agustine, the CEO of Lockheed/Martin Marietta has predicted that the "golden toilet seat" will be hanging about our necks so long was we refuse to solve our accountability problems.

7. If tenure is to remain in place, then we will have to insure the process has a value-added role. The present tenure process engenders behavior that is not necessarily positive. For example, recognizing the short time allowed for earning tenure given present standards, we often provide non-tenured faculty

reduced teaching assignments so they can develop their research portfolio. I would contend this gives a message about what is important and what is not, one that is hard to change later.

We can hear voices that are finding resonance with some in our land who argue that tenure and faculty governance stand in the way of progress. Speaker Newt Gingrich in his book, "To Renew America" cites a case where a faculty opposed the implementation of a distance learning network, and he comments, "The faculty - like any other guild or labor union - wanted to deliver less education for more money." He goes on to say, "College and university faculties have developed a game in which they have lots of petty power with very little accountability.....We need a thorough review of higher education by outsiders to determine how America can best organize learning for adults."

While we may understand that there are other dimensions to these issues, we have to have our house in order to be able to properly defend ourselves.

8. We have to find the means to be an active participant in the student life issues and to insure continuing openness to diversity and plurality. Our students can learn much from their out-of-class experiences and we need to play a larger role here while insuring we are open to all who are willing to make the commitment to a Tech education.

9. While we adapt to change, we need to never lose sight of our core values and traditions because they have molded Tech into the unique resource it has become in our society.

In closing, thank you for this opportunity to share some

thoughts about the future of the research university. We need to expand the opportunities to carry on a productive dialog as we move forward into what is surely to be a new era for higher education.